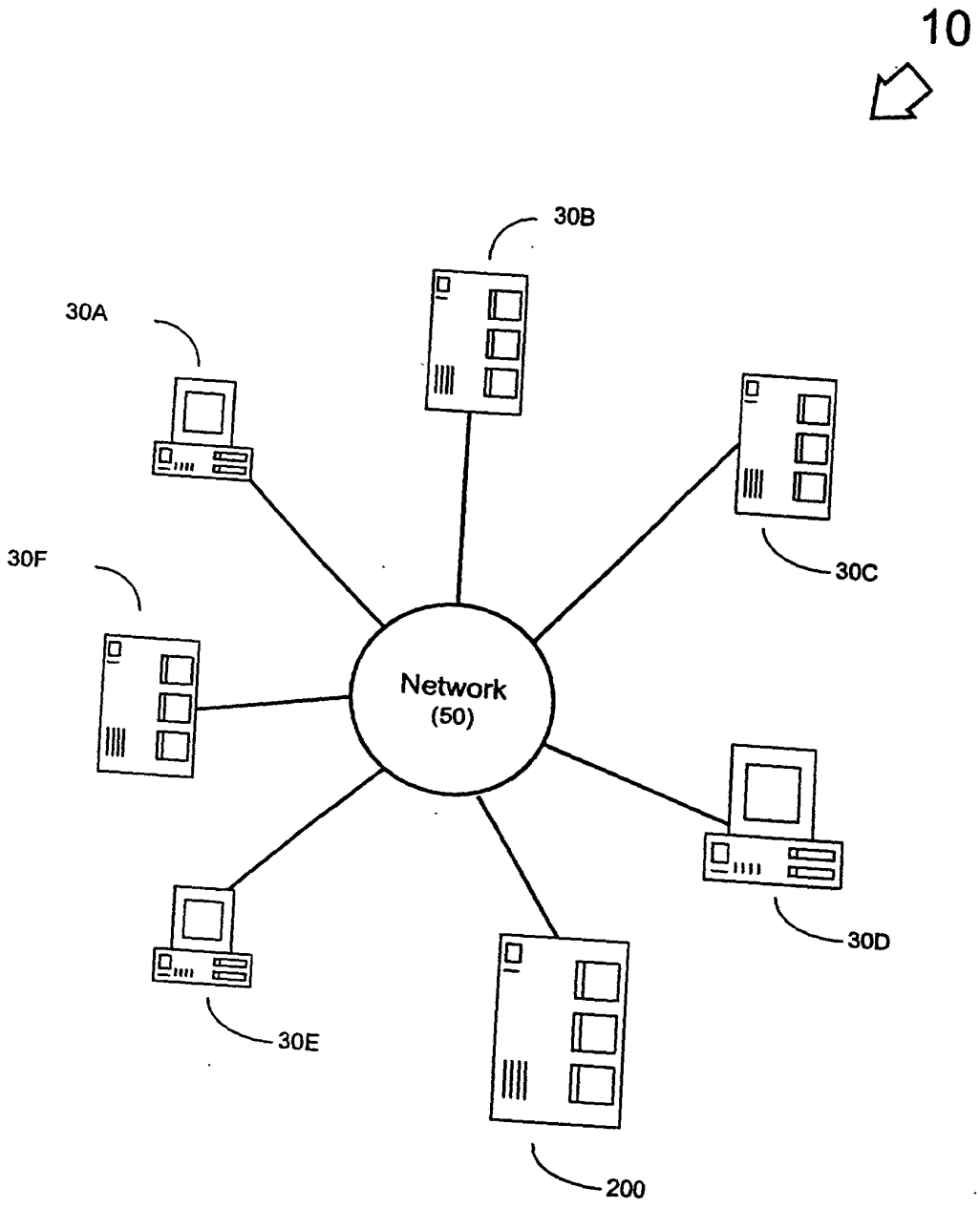


FIG. 1

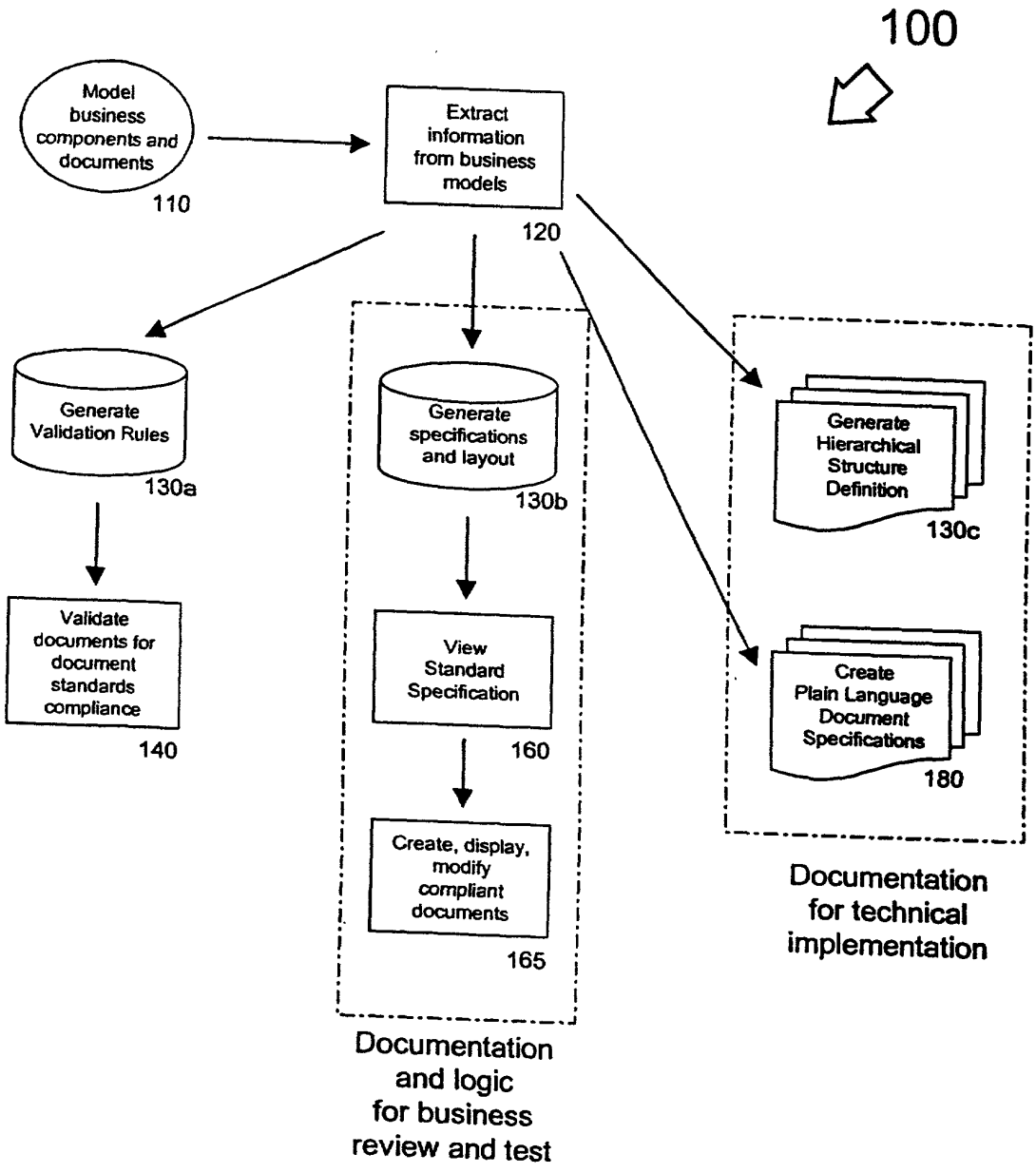
100
Model business components and documents
110
Extract information from business models
120
Generate Validation Rules
130a
Validate documents for document standards compliance
140
Generate specifications and layout
130b
View Standard Specification
160
Create, display, modify compliant documents
165
Documentation and logic for business review and test
Generate Hierarchical Structure Definition
130c
Create Plain Language Document Specifications
180
Documentation for technical implementation

FIG. 2

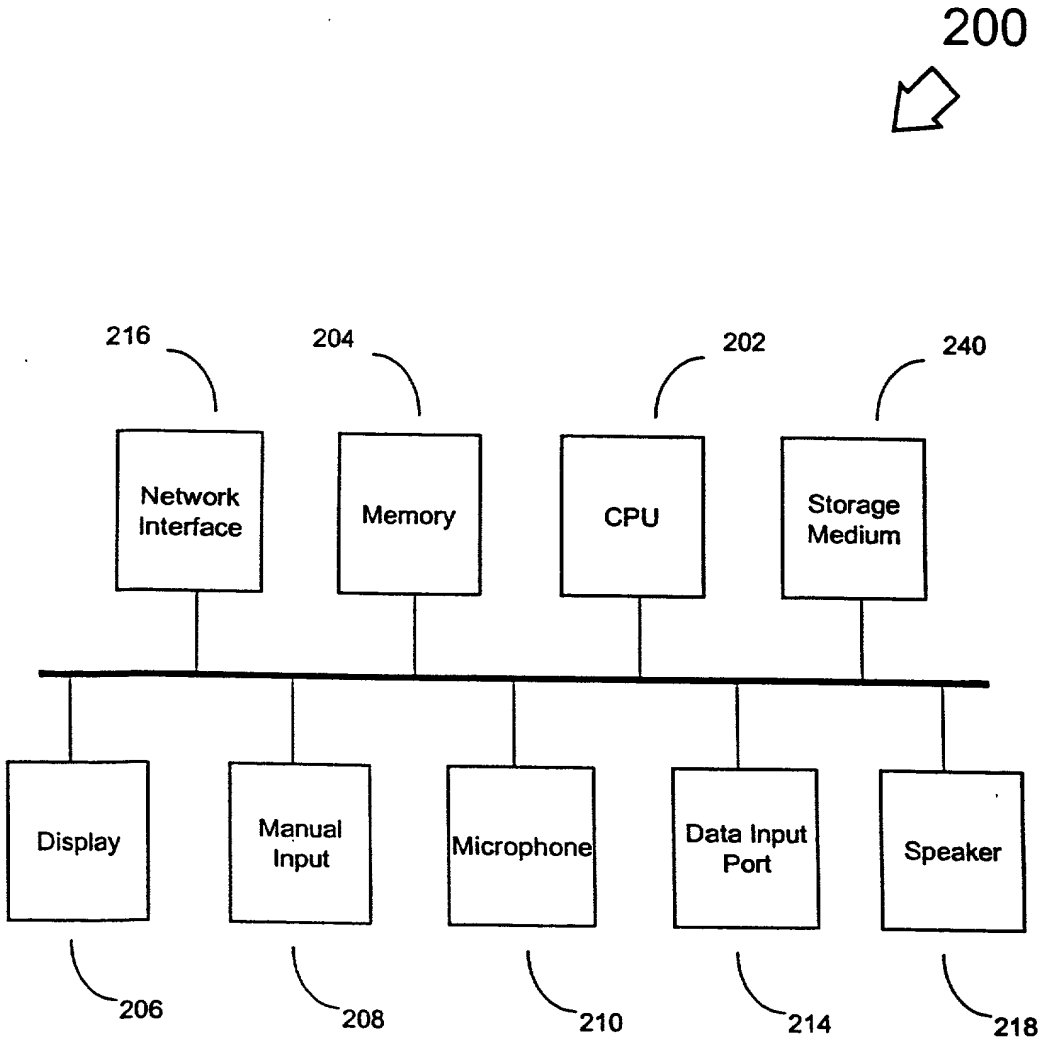
200
216
204
202
240
Network Interface
Memory
CPU
Storage Medium
Display
Manual Input
Microphone
Data Input Port
Speaker
206
208
210
214
218

FIG. 3

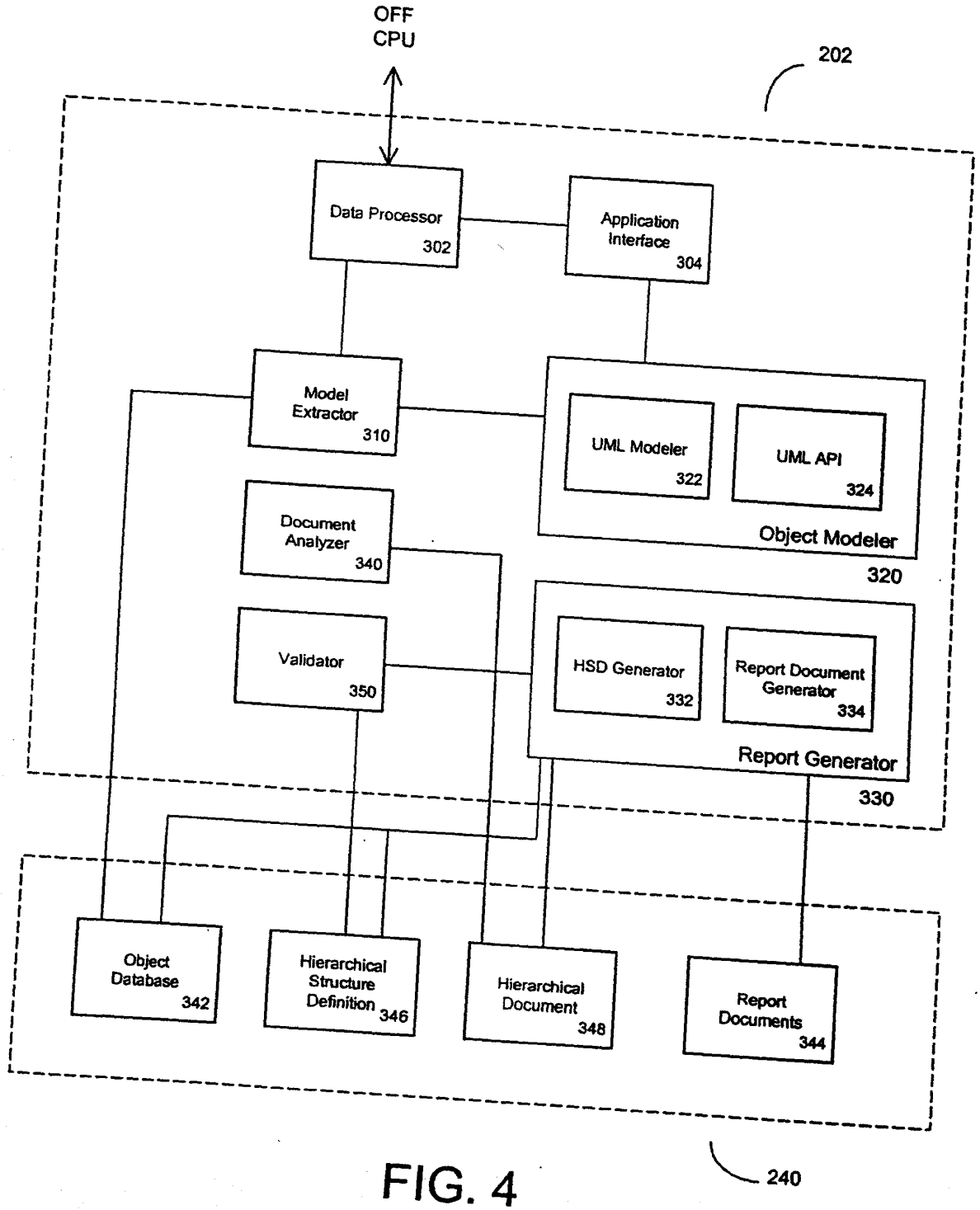
OFF CPU
202
Data Processor 302
Application Interface 304
Model Extractor 310
UML Modeler 322
UML API 324
Object Modeler 320
Document Analyzer 340
Validator 350
HSD Generator 332
Report Document Generator 334
Report Generator 330
Object Database 342
Hierarchical Structure Definition 346
Hierarchical Document 348
Report Documents 344
240

FIG. 4

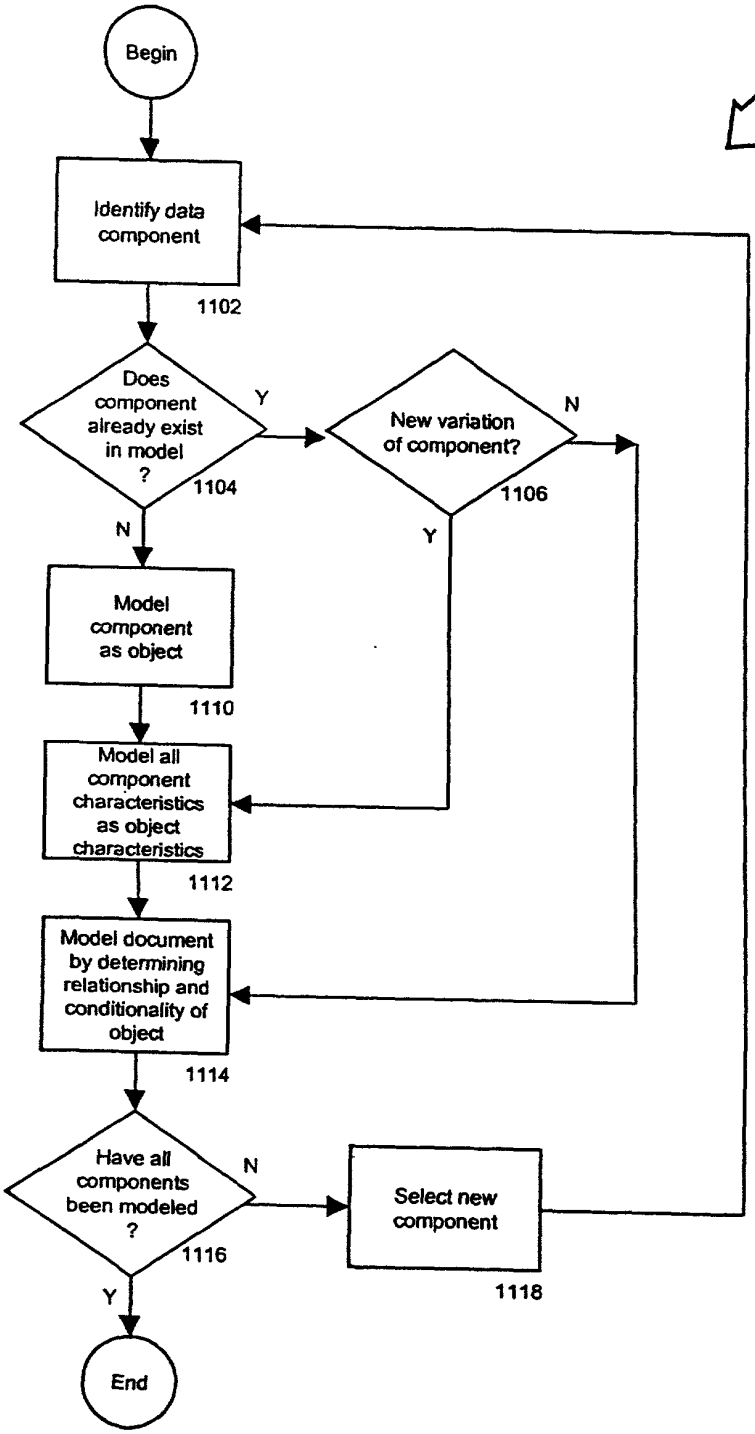
110
Begin
Identify data component
1102
Does component already exist in model ?
1104
Y
N
New variation of component?
1106
N
Y
Model component as object
1110
Model all component characteristics as object characteristics
1112
Model document by determining relationship and conditionality of object
1114
Have all components been modeled ?
1116
N
Y
Select new component
1118
End

FIG. 5

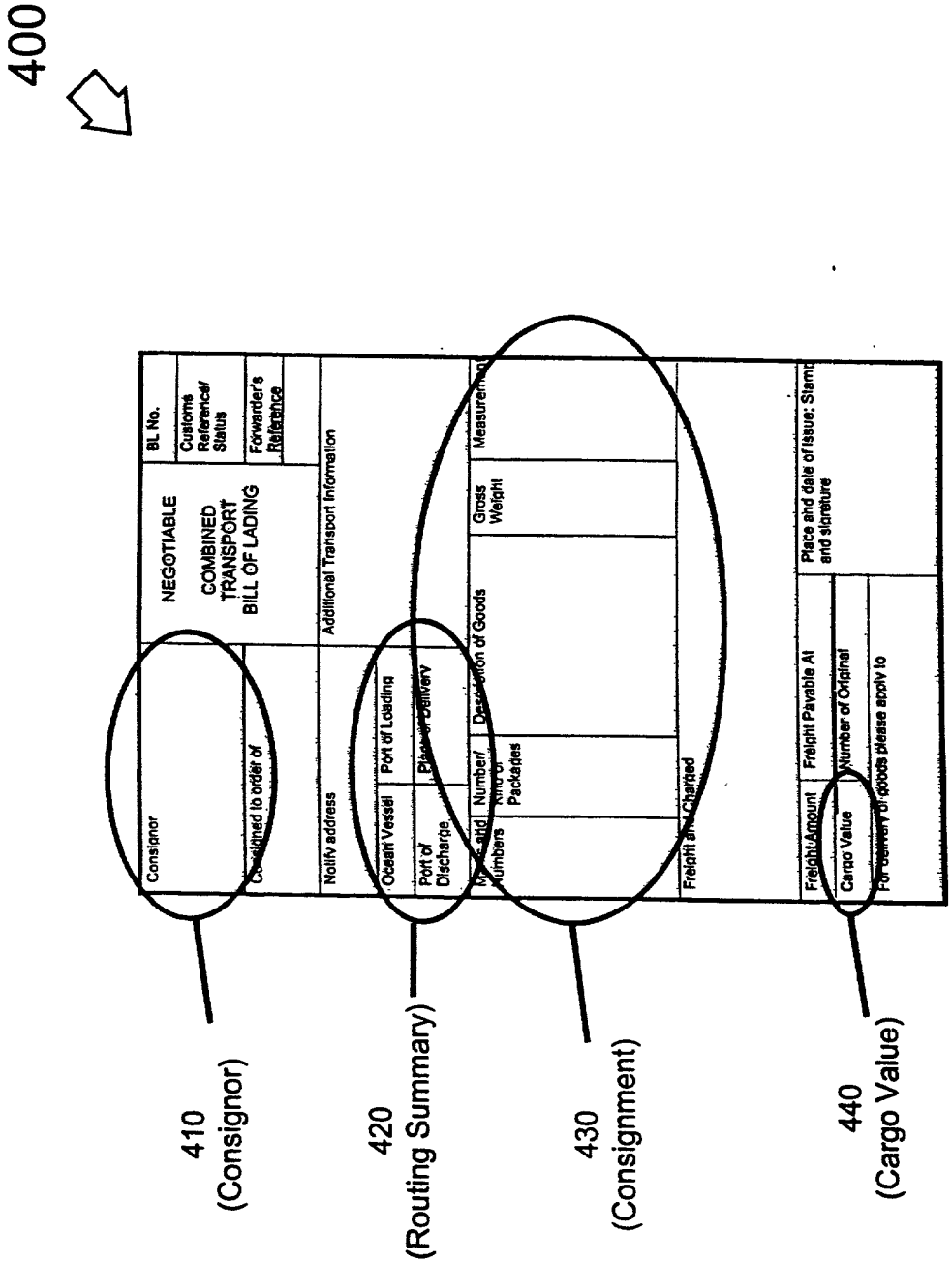
400
NEGOTIABLE
COMBINED TRANSPORT BILL OF LADING
B/L No.
Customs Reference/ Status
Forwarder's Reference
Consignor
Consigned to order of
Additional Transport Information
Notify address
Ocean Vessel
Port of Loading
Port of Discharge
Place of Delivery
Number/ Kind of Packages
Description of Goods
Gross Weight
Measurement
Freight and Charges
Freight Amount
Freight Payable At
Place and date of issue; Stamp and signature
Cargo Value
Number of Original
For delivery of goods please apply to
410 (Consignor)
420 (Routing Summary)
430 (Consignment)
440 (Cargo Value)

FIG. 6A

20010702.1153860

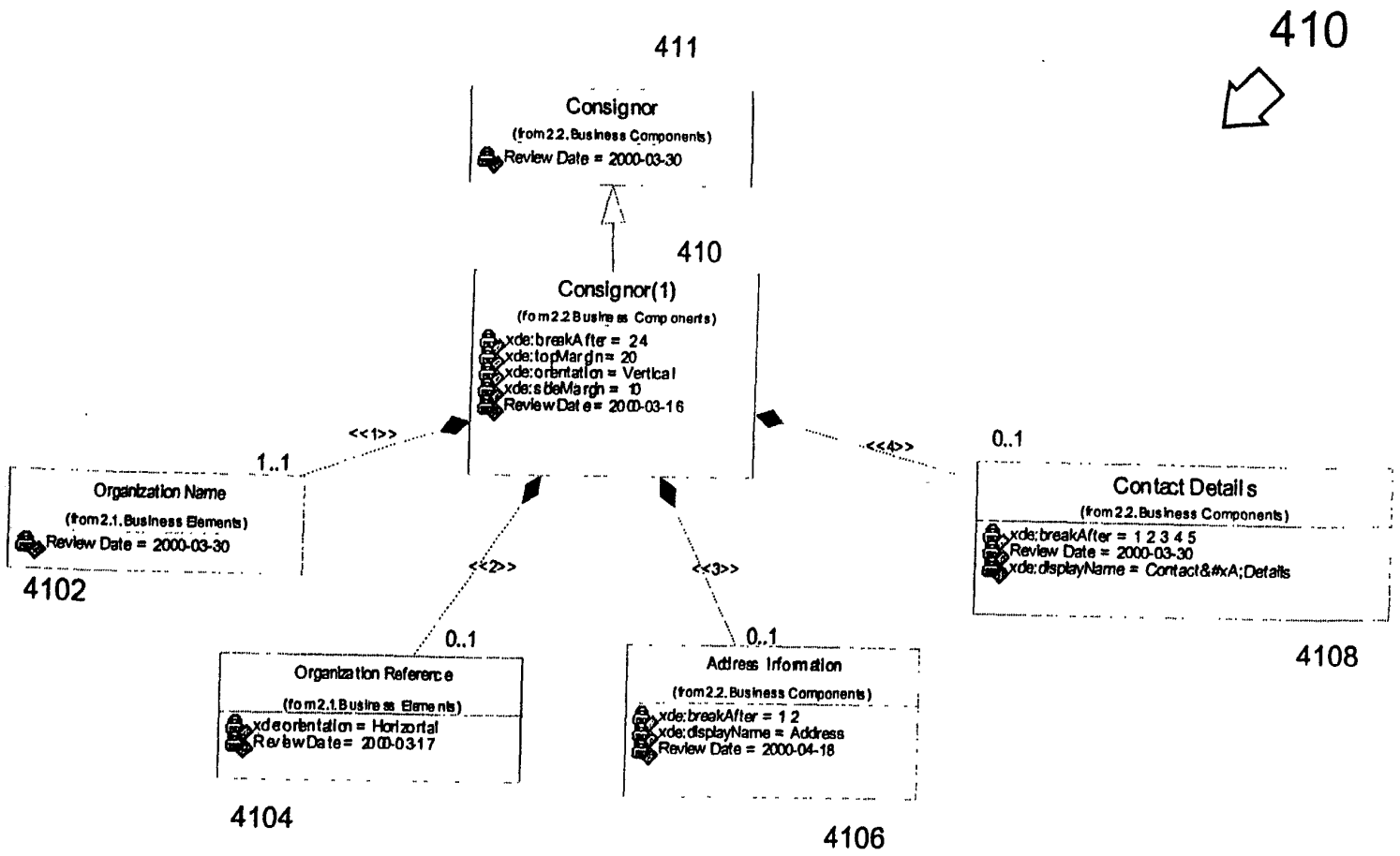


FIG. 6B

U.S.S.N. 09/885,474 of Goatly et al.; Filed June 20 2001; Entitled: Standards Development Package Method and System; Atty Dkt No.: 82045-272204; Pillsbury Winthrop LLP; (619) 544-3108; Sheet 7 of 29 (Figs. 1-19)

20070910246860

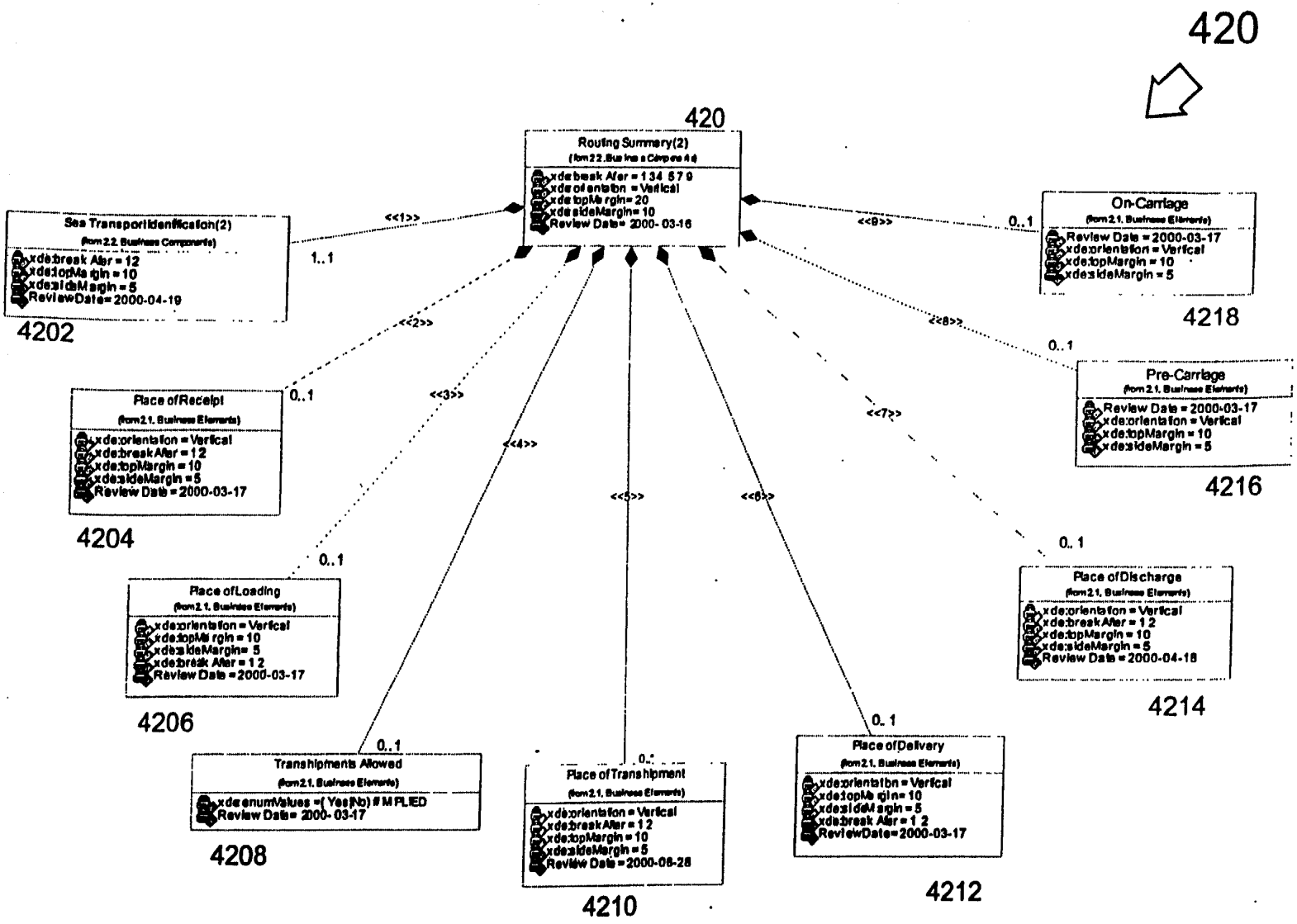


FIG. 6C

U.S.S.N. 09/885,474 of Goatly et al.; Filed June 20, 2001; Entitled: Standards Development Package Method and System; Atty Dkt No.: 82045-272204; Pillsbury Winthrop LLP; (619) 544-3108; Sheet 8 of 29 (Figs. 1-19)

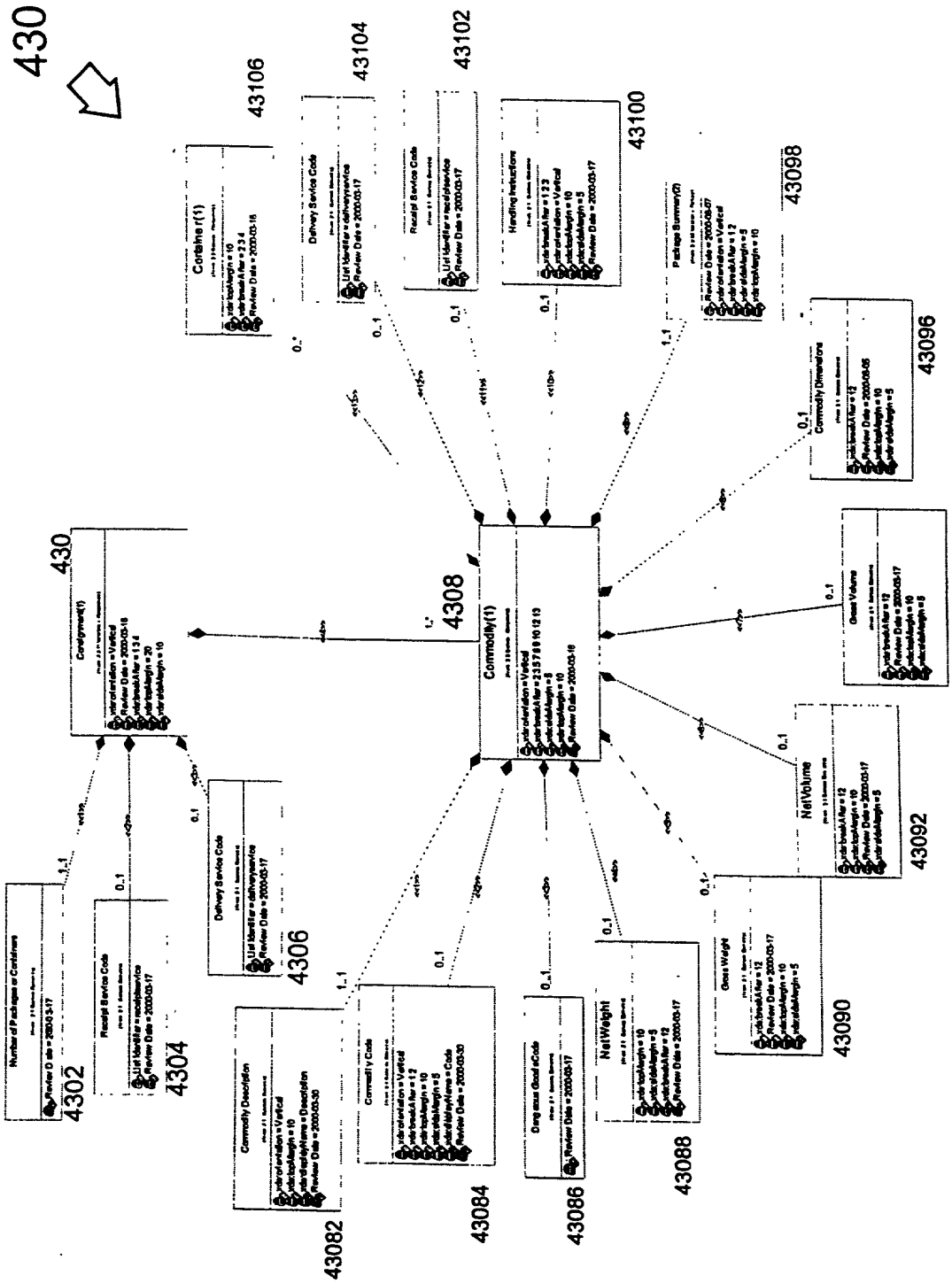
430
Consignment(1)
Commodity(1)
Container(1)
Number of Packages in Container
Receipt Service Code
Delivery Service Code
Commodity Description
Commodity Code
Dangerous Goods Code
Net Weight
Gross Weight
Net Volume
Gross Volume
Commodity Dimensions
Handling Instructions
Package Summary(2)
4302
4304
4306
4308
43082
43084
43086
43088
43090
43092
43094
43096
43098
43100
43102
43104
43106

FIG. 6D

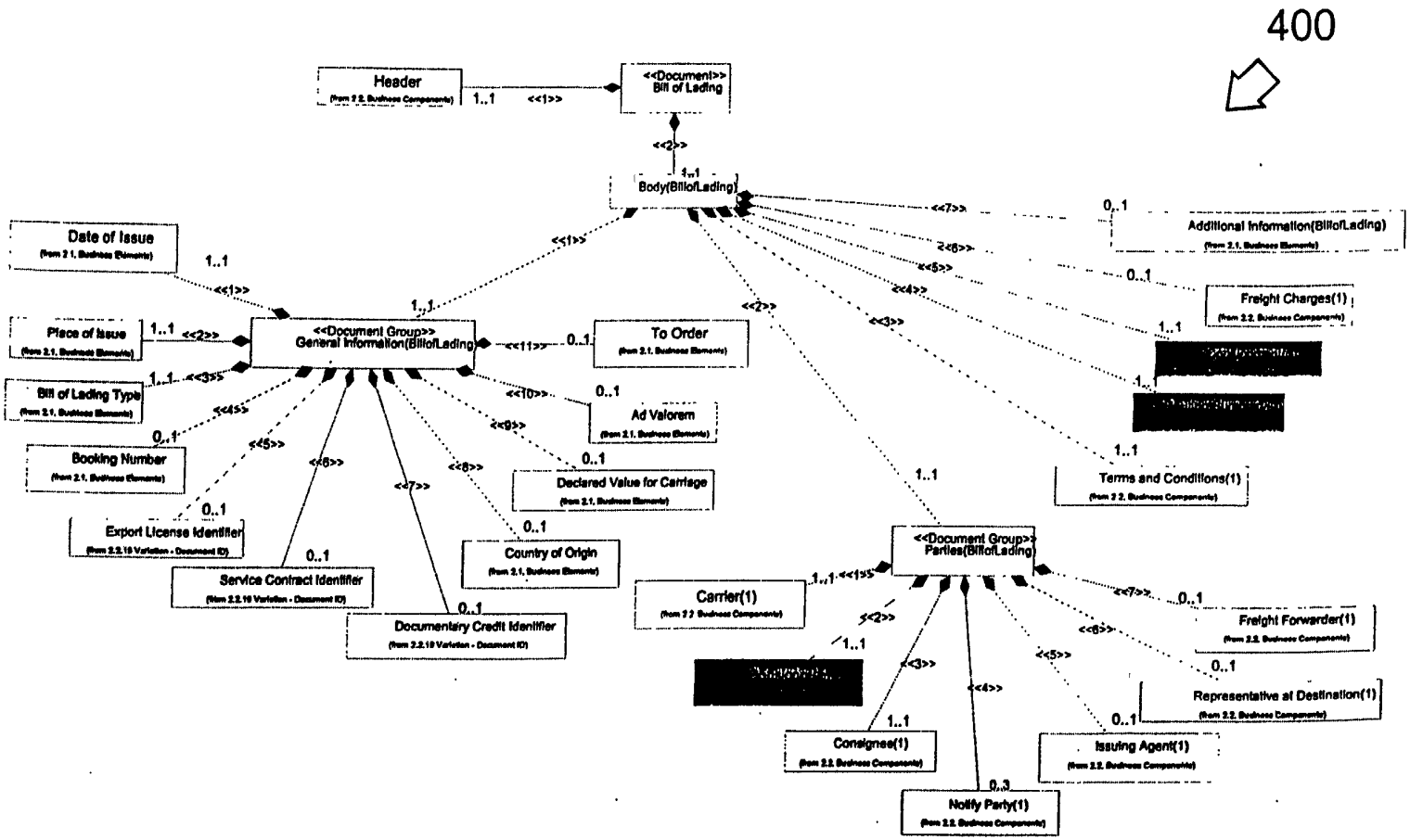
400
Header
1..1
<<1>>
<<Document>>
Bill of Lading
<<2>>
1..1
Body(BillofLading)
Date of Issue
1..1
<<1>>
Place of Issue
1..1
<<2>>
Bill of Lading Type
1..1
<<3>>
Booking Number
0..1
<<4>>
Export License Identifier
0..1
<<5>>
Service Contract Identifier
0..1
<<6>>
Documentary Credit Identifier
0..1
<<7>>
<<Document Group>>
General Information(BillofLading)
1..1
<<11>>
To Order
0..1
<<10>>
Ad Valorem
0..1
<<9>>
Declared Value for Carriage
0..1
<<8>>
Country of Origin
0..1
<<7>>
Additional Information(BillofLading)
0..1
<<6>>
Freight Charges(1)
0..1
<<5>>
[redacted]
1..1
<<4>>
[redacted]
1..1
<<3>>
Terms and Conditions(1)
1..1
<<2>>
<<Document Group>>
Parties(BillofLading)
1..1
<<1>>
Carrier(1)
1..1
<<2>>
[redacted]
1..1
<<3>>
Consignee(1)
1..1
<<4>>
Notify Party(1)
0..3
<<5>>
Issuing Agent(1)
0..1
<<6>>
Representative at Destination(1)
0..1
<<7>>
Freight Forwarder(1)
0..1

FIG. 6E

20070"h2h58860

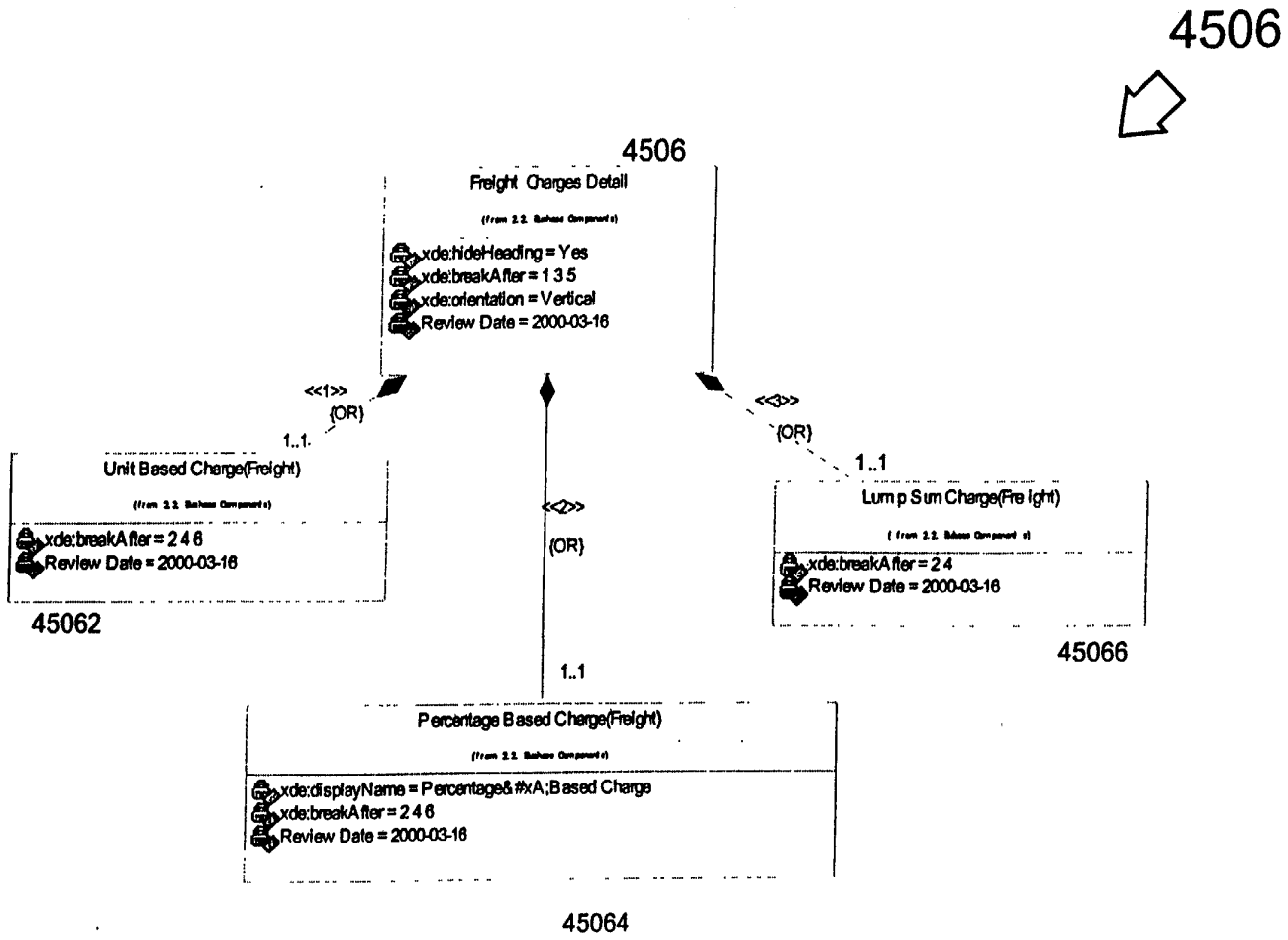


FIG. 6F

U.S.S.N. 09/885,474 of Goatly et al.; Filed June 20, 2001; Entitled: Standards Development Package Method and System; Atty Dkt No.: 82045-27204; Pillsbury Winthrop LLP; (619) 544-3108; Sheet 11 of 29 (Figs. 1-19)

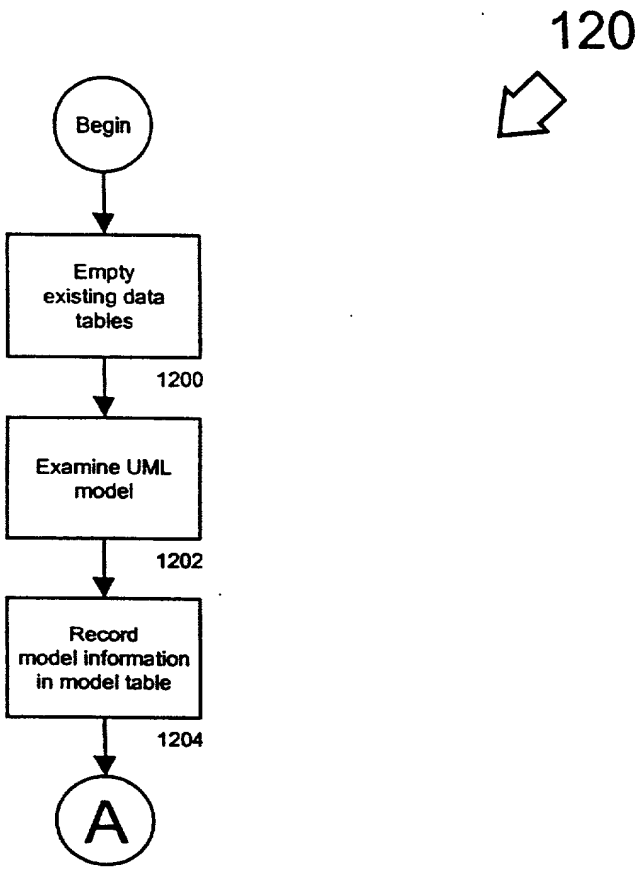
120
Begin
Empty existing data tables
1200
Examine UML model
1202
Record model information in model table
1204
A

FIG. 7A

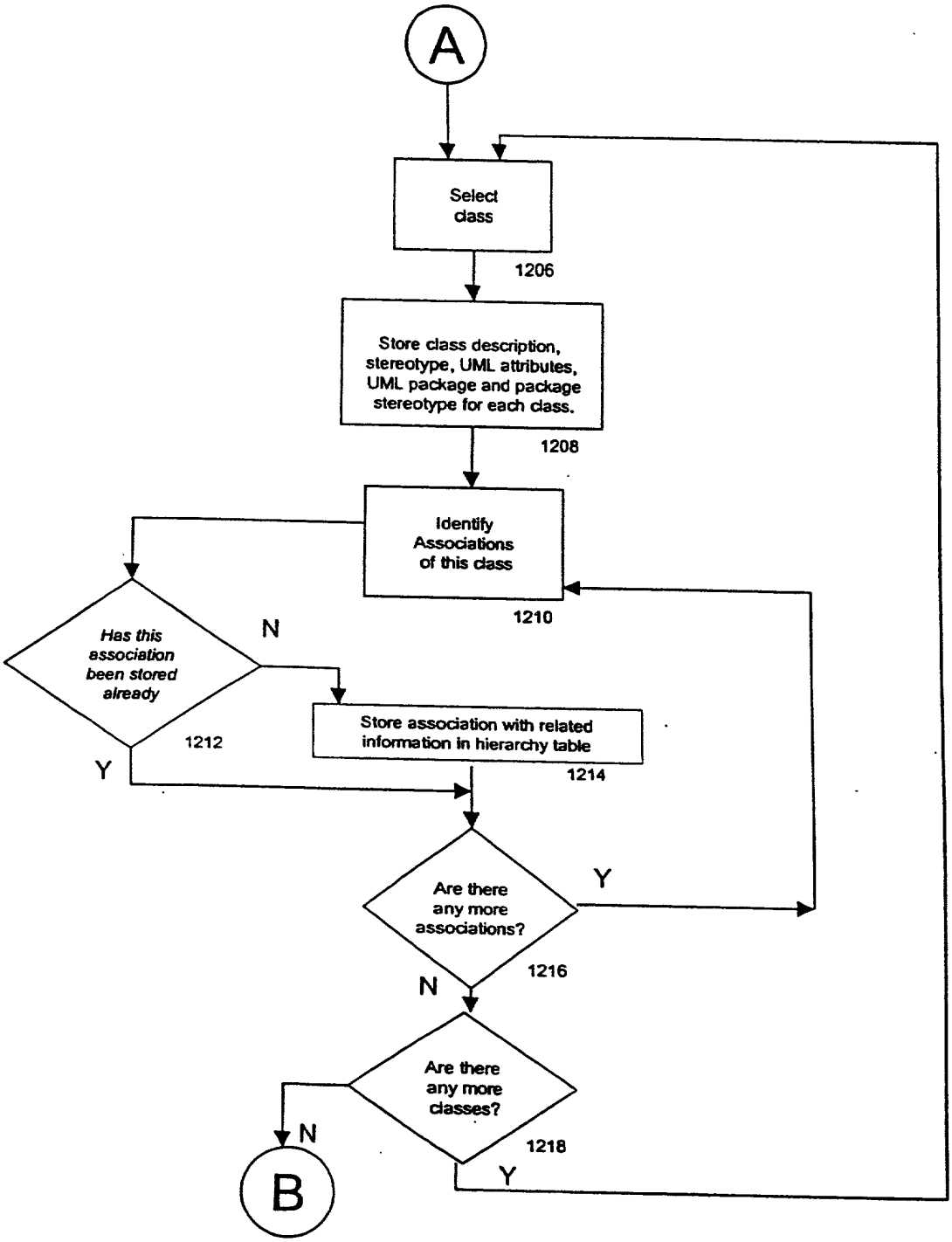
A
Select class
1206
Store class description, stereotype, UML attributes, UML package and package stereotype for each class.
1208
Identify Associations of this class
1210
Has this association been stored already
N
Y
1212
Store association with related information in hierarchy table
1214
Are there any more associations?
Y
N
1216
Are there any more classes?
N
Y
1218
B

FIG. 7B

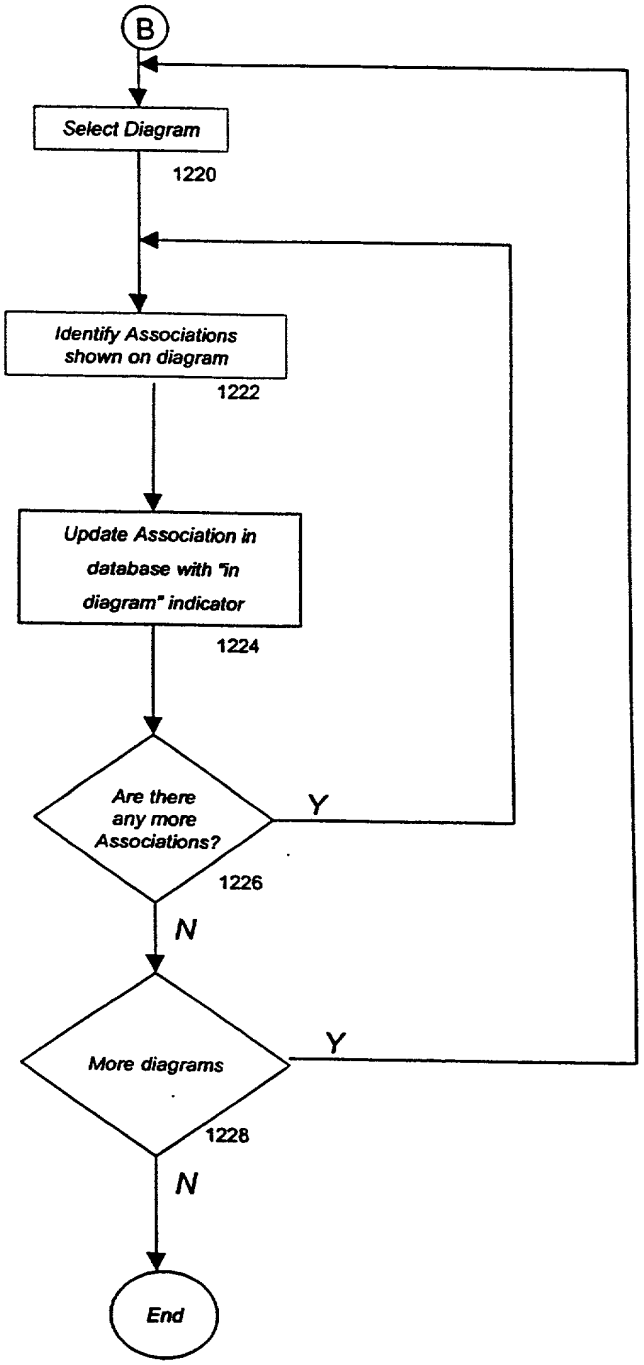
B
Select Diagram
1220
Identify Associations shown on diagram
1222
Update Association in database with "in diagram" indicator
1224
Are there any more Associations?
1226
Y
N
More diagrams
1228
Y
N
End

FIG. 7C

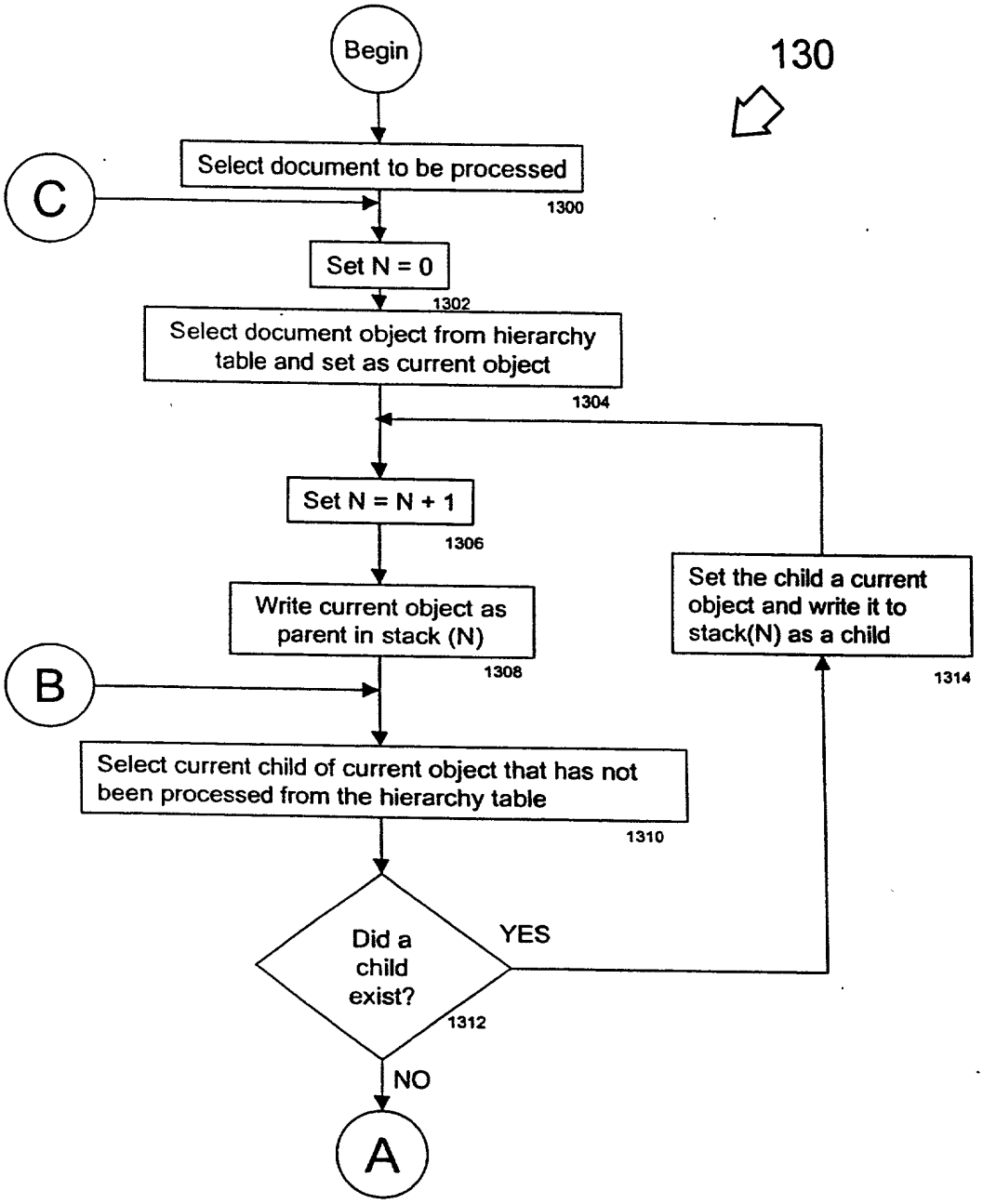
130
Begin
Select document to be processed
1300
C
Set N = 0
1302
Select document object from hierarchy table and set as current object
1304
Set N = N + 1
1306
Write current object as parent in stack (N)
1308
B
Select current child of current object that has not been processed from the hierarchy table
1310
Did a child exist?
1312
YES
NO
A
Set the child a current object and write it to stack(N) as a child
1314

FIG. 8A

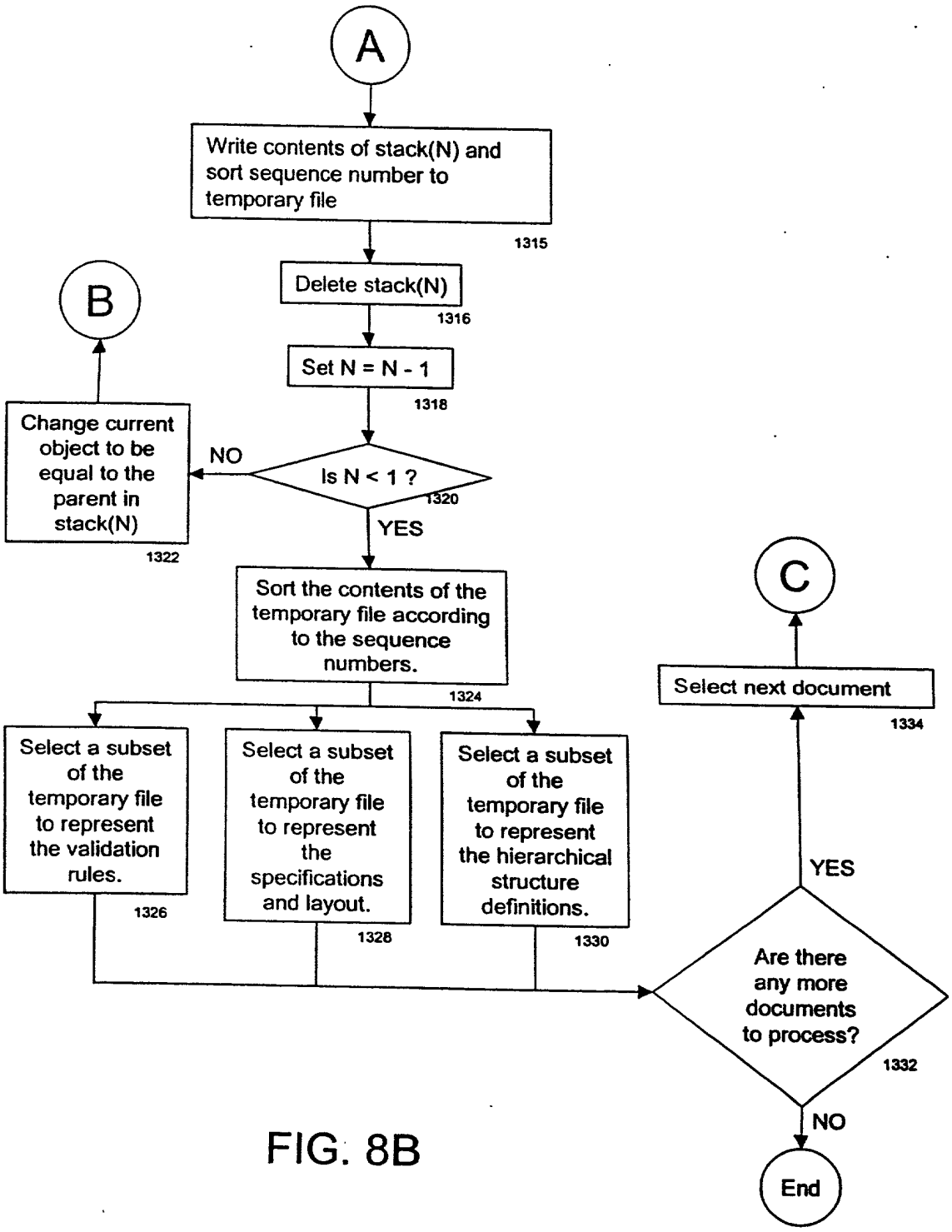
A
Write contents of stack(N) and sort sequence number to temporary file
1315
Delete stack(N)
1316
Set N = N - 1
1318
Is N < 1 ?
1320
NO
YES
B
Change current object to be equal to the parent in stack(N)
1322
Sort the contents of the temporary file according to the sequence numbers.
1324
Select a subset of the temporary file to represent the validation rules.
1326
Select a subset of the temporary file to represent the specifications and layout.
1328
Select a subset of the temporary file to represent the hierarchical structure definitions.
1330
C
Select next document
1334
Are there any more documents to process?
1332
YES
NO
End

FIG. 8B

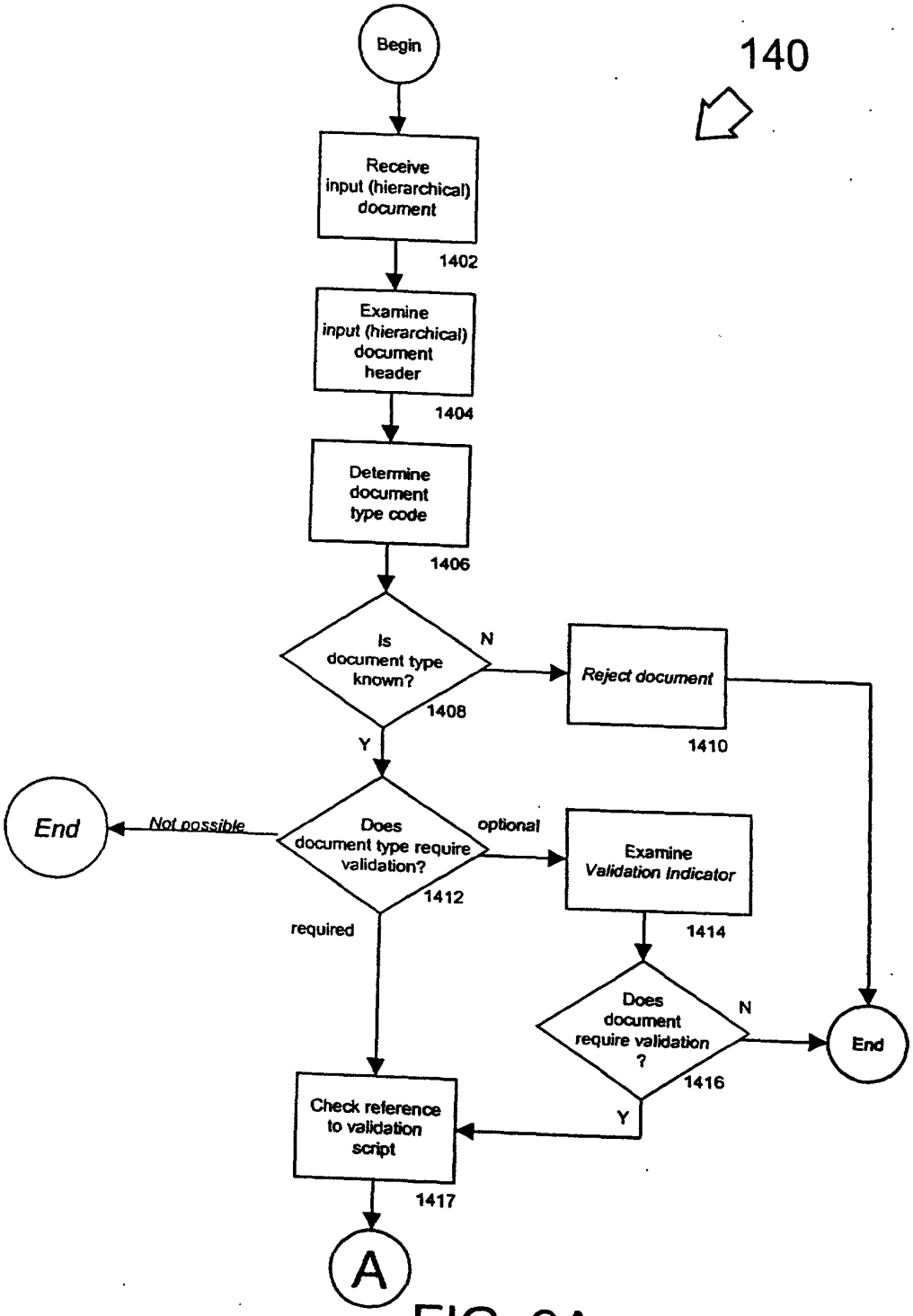
140
Begin
Receive input (hierarchical) document
1402
Examine input (hierarchical) document header
1404
Determine document type code
1406
Is document type known?
1408
N
Reject document
1410
Y
End
Not possible
Does document type require validation?
1412
optional
Examine Validation Indicator
1414
required
Does document require validation ?
1416
N
End
Y
Check reference to validation script
1417
A

FIG. 9A

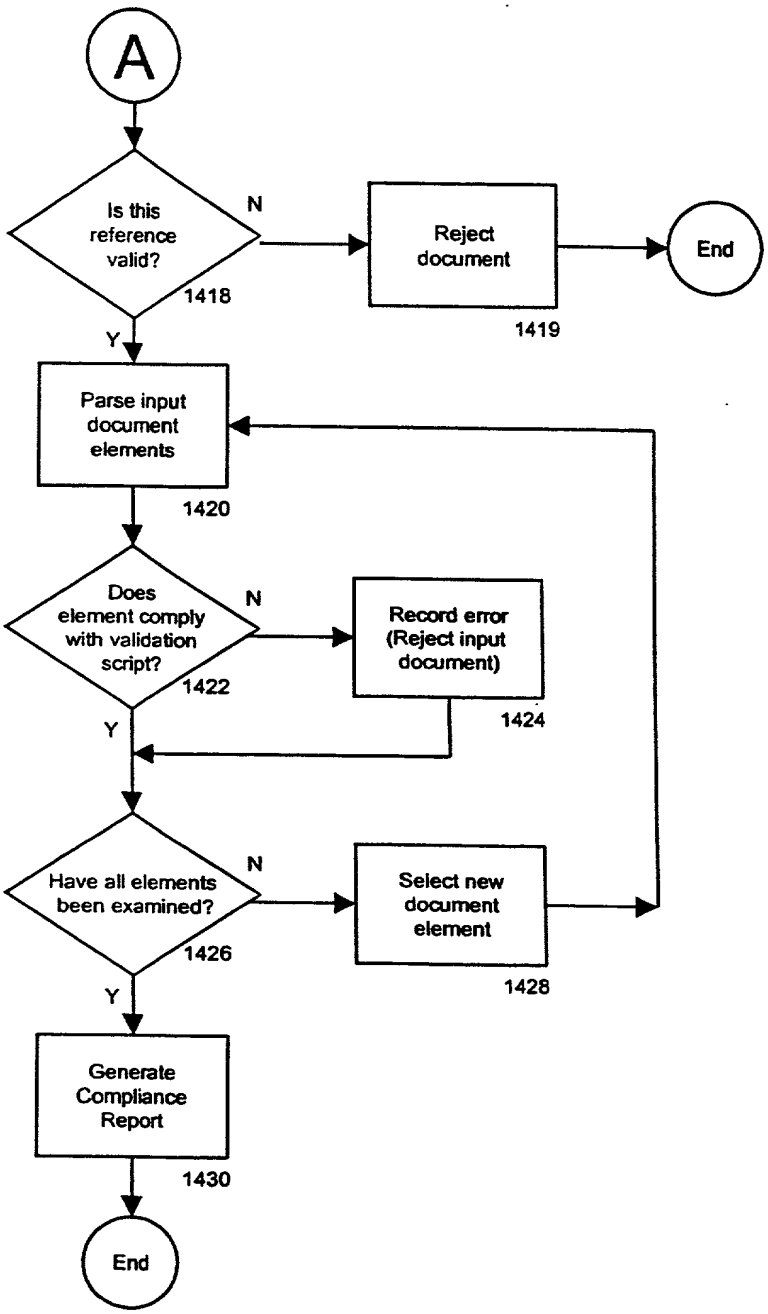
A
Is this reference valid?
N
1418
Reject document
End
1419
Y
Parse input document elements
1420
Does element comply with validation script?
N
1422
Record error (Reject input document)
1424
Y
Have all elements been examined?
N
1426
Select new document element
1428
Y
Generate Compliance Report
1430
End

FIG. 9B

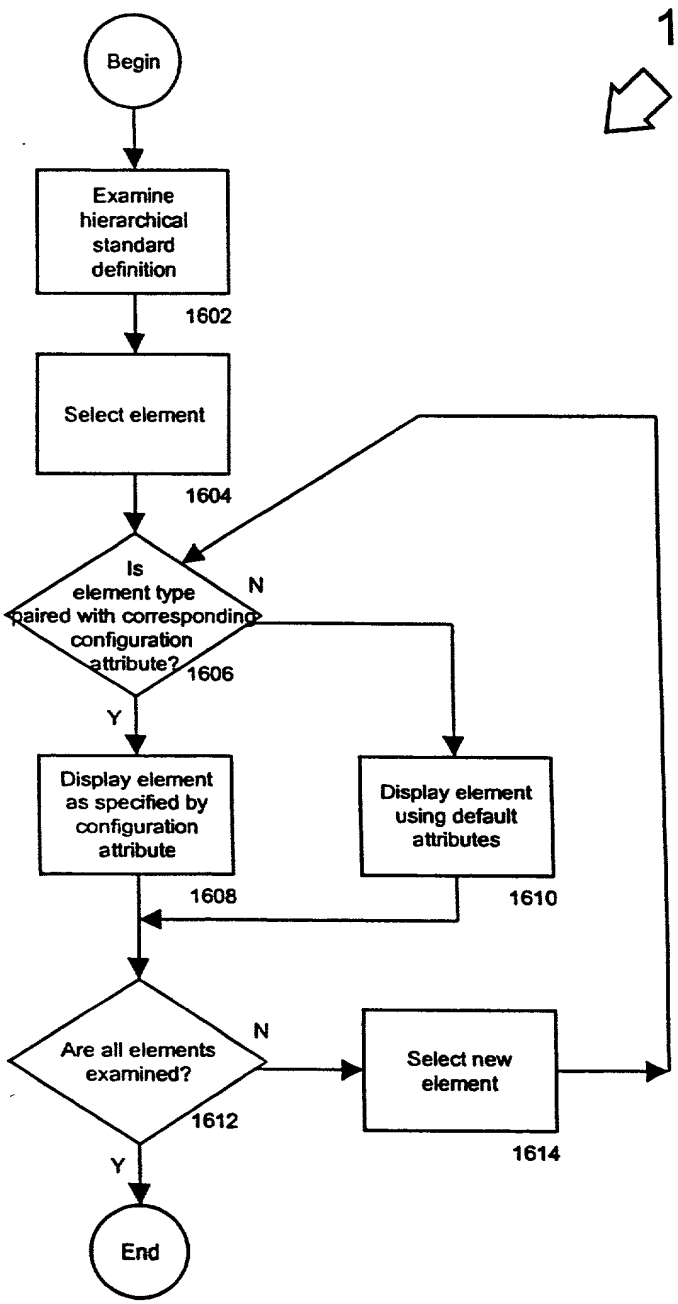
160
Begin
Examine hierarchical standard definition
1602
Select element
1604
Is element type paired with corresponding configuration attribute?
1606
N
Y
Display element as specified by configuration attribute
1608
Display element using default attributes
1610
Are all elements examined?
1612
N
Y
Select new element
1614
End

FIG. 10

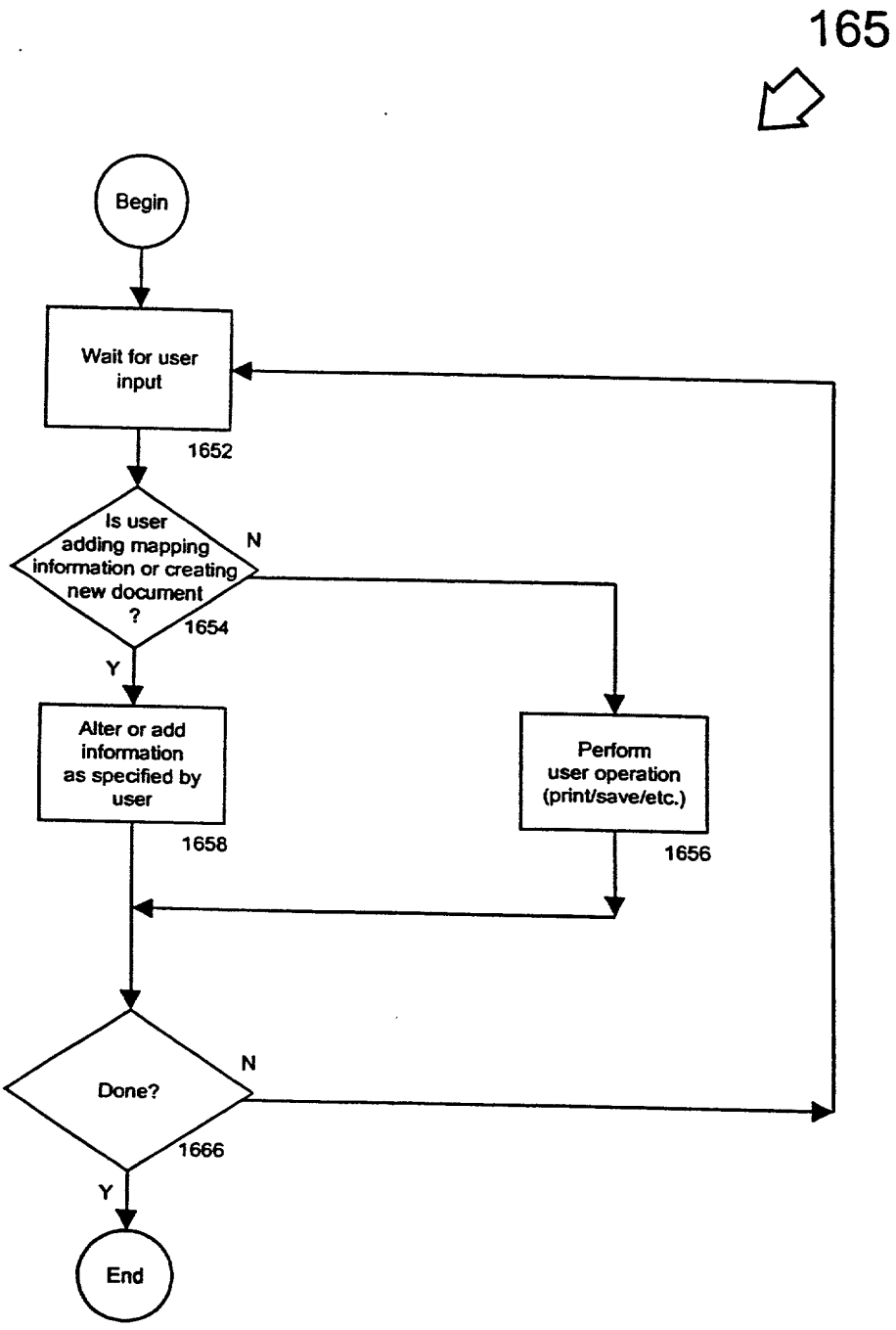
165
Begin
Wait for user input
1652
Is user adding mapping information or creating new document ?
1654
N
Y
Alter or add information as specified by user
1658
Perform user operation (print/save/etc.)
1656
Done?
1666
N
Y
End

FIG. 11

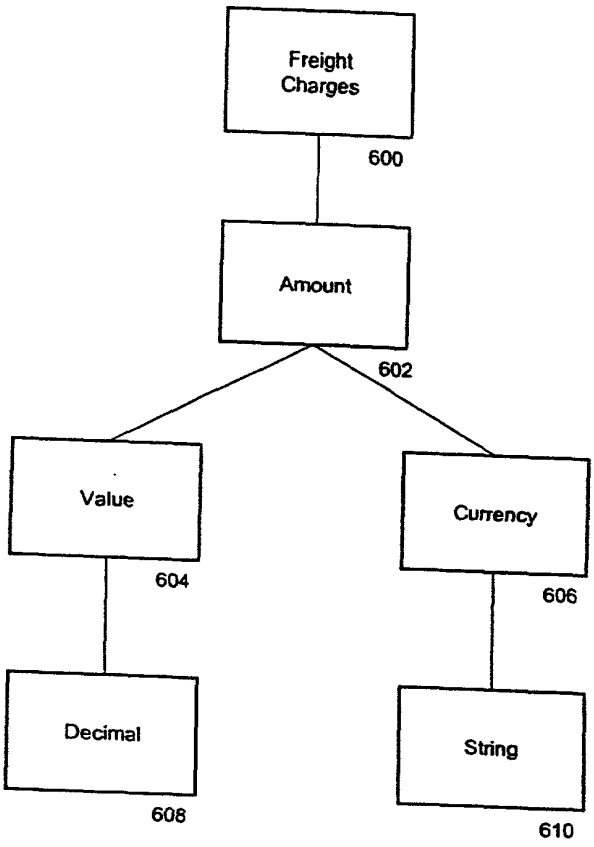
Freight Charges
600
Amount
602
Value
604
Currency
606
Decimal
608
String
610

FIG. 12

300

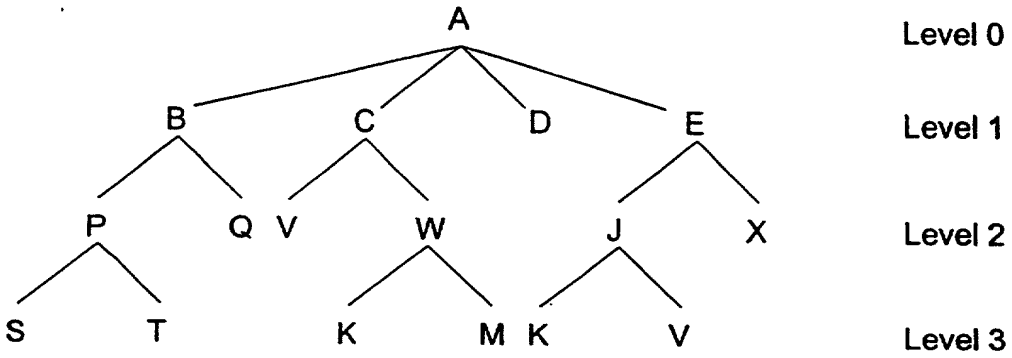


FIG. 13A

300

**Hierarchy Table**

| Parent | Child |
|---|---|
| A | B |
| A | C |
| A | D |
| A | E |
| B | P |
| B | Q |
| P | S |
| P | T |
| C | V |
| C | W |
| W | K |
| W | M |
| E | J |
| J | K |
| J | V |
| E | X |

FIG. 13B

300

**Generated Table**

| Level | Class | Type |
|---|---|---|
| 0 | A | Document |
| 1 | B | Class |
| 2 | P | Class |
| 3 | S | Data |
| 3 | T | Data |
| 2 | Q | Data |
| 1 | C | Class |
| 2 | V | Data |
| 2 | W | Class |
| 3 | K | Data |
| 3 | M | Data |
| 1 | D | Data |
| 1 | E | Class |
| 2 | J | Class |
| 3 | K | Data |
| 3 | V | Data |
| 2 | X | Data |

FIG. 13C

300

**HSD (Schematic) Output**

A(B,C,D,E)
B(P,Q)
C(V,W)
E(J,X)
P(S,T)
W(K,M)
J(K,V)
...

FIG. 13D

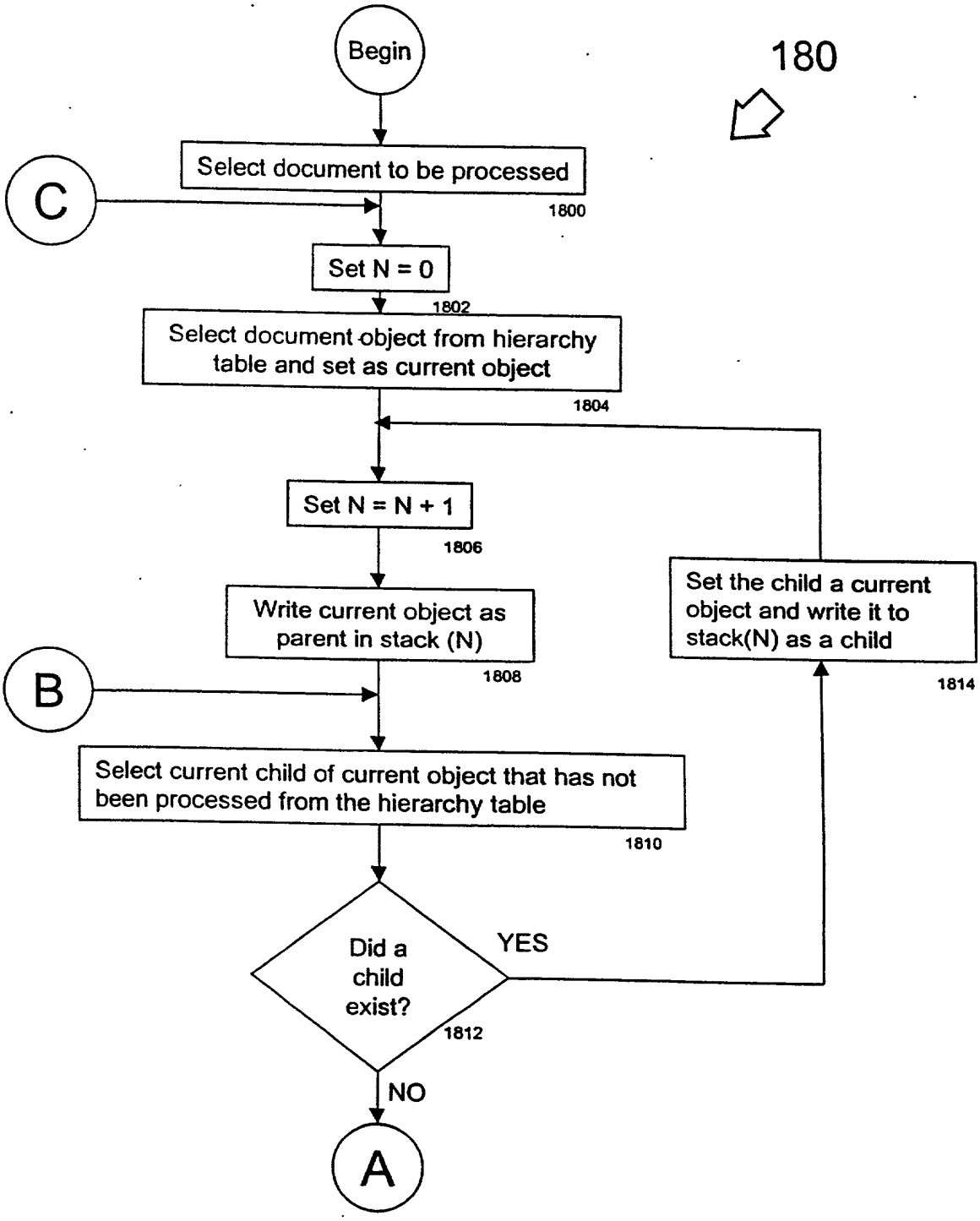
180
Begin
Select document to be processed
1800
C
Set N = 0
1802
Select document object from hierarchy table and set as current object
1804
Set N = N + 1
1806
Write current object as parent in stack (N)
1808
B
Select current child of current object that has not been processed from the hierarchy table
1810
Did a child exist?
1812
YES
NO
Set the child a current object and write it to stack(N) as a child
1814
A

FIG. 14A

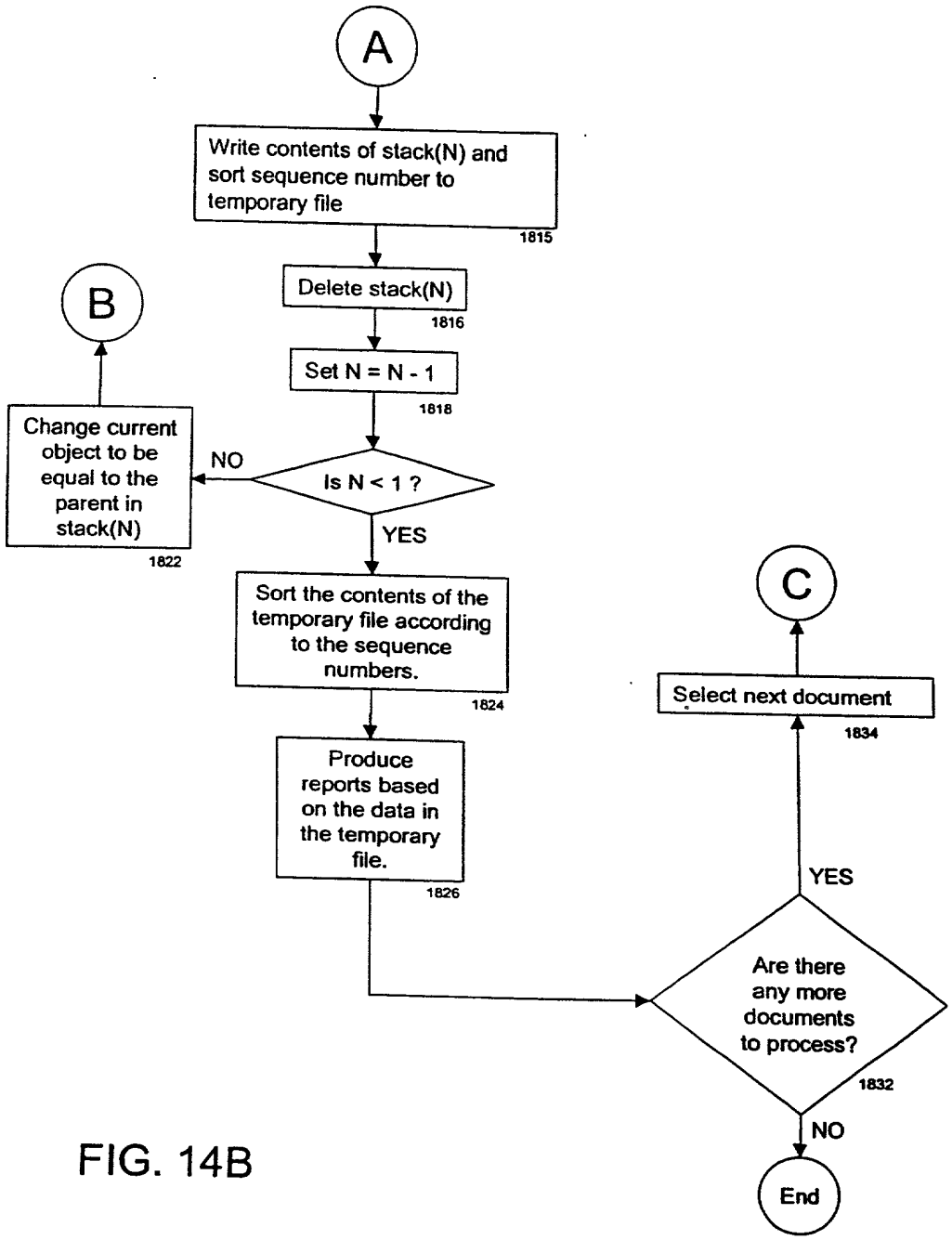
A
Write contents of stack(N) and sort sequence number to temporary file
1815
Delete stack(N)
1816
Set N = N - 1
1818
Is N < 1 ?
NO
YES
B
Change current object to be equal to the parent in stack(N)
1822
Sort the contents of the temporary file according to the sequence numbers.
1824
Produce reports based on the data in the temporary file.
1826
C
Select next document
1834
Are there any more documents to process?
1832
YES
NO
End

FIG. 14B

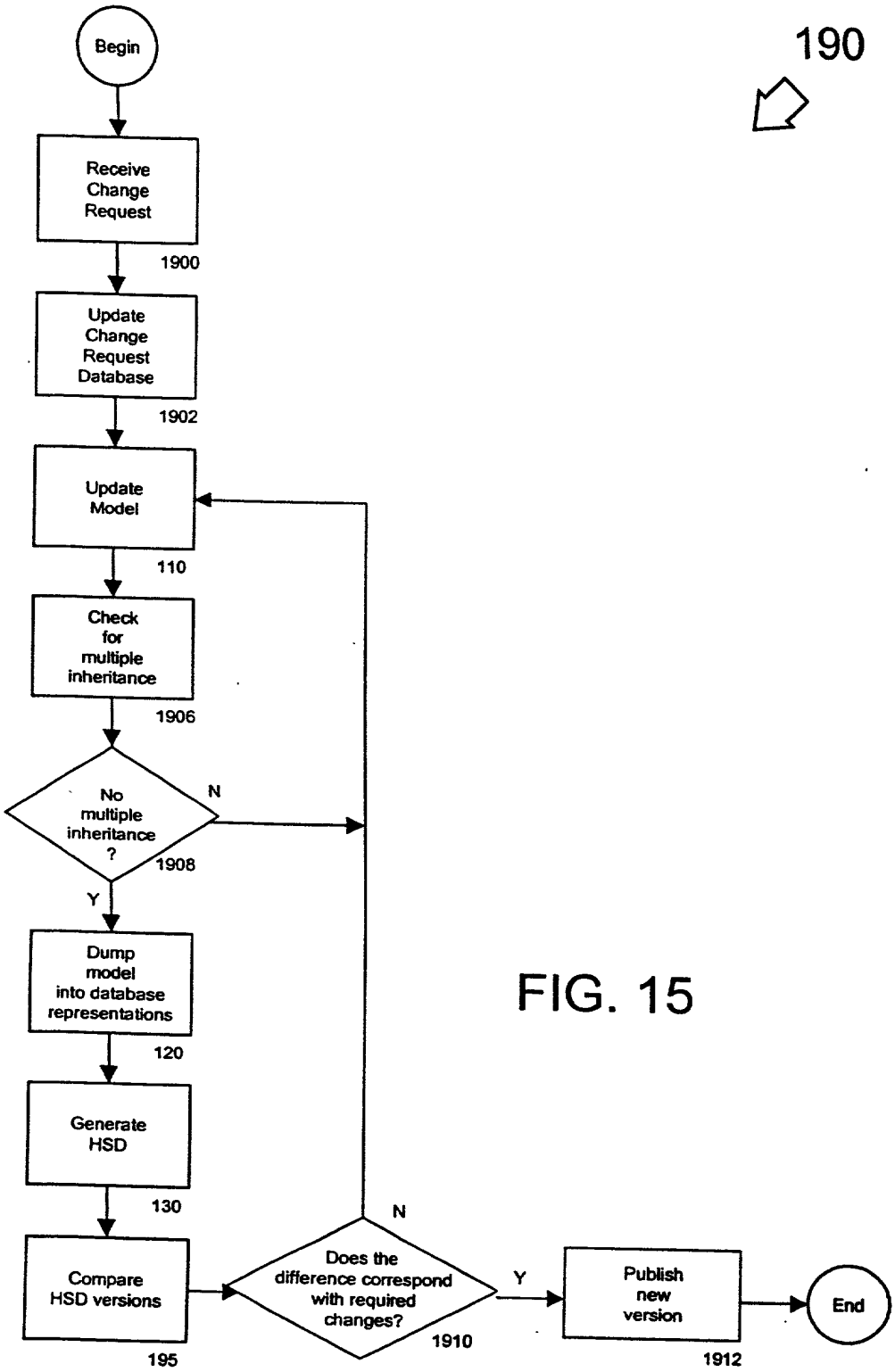
190
Begin
Receive Change Request
1900
Update Change Request Database
1902
Update Model
110
Check for multiple inheritance
1906
No multiple inheritance ?
1908
N
Y
Dump model into database representations
120
Generate HSD
130
Compare HSD versions
195
Does the difference correspond with required changes?
1910
N
Y
Publish new version
1912
End

FIG. 15

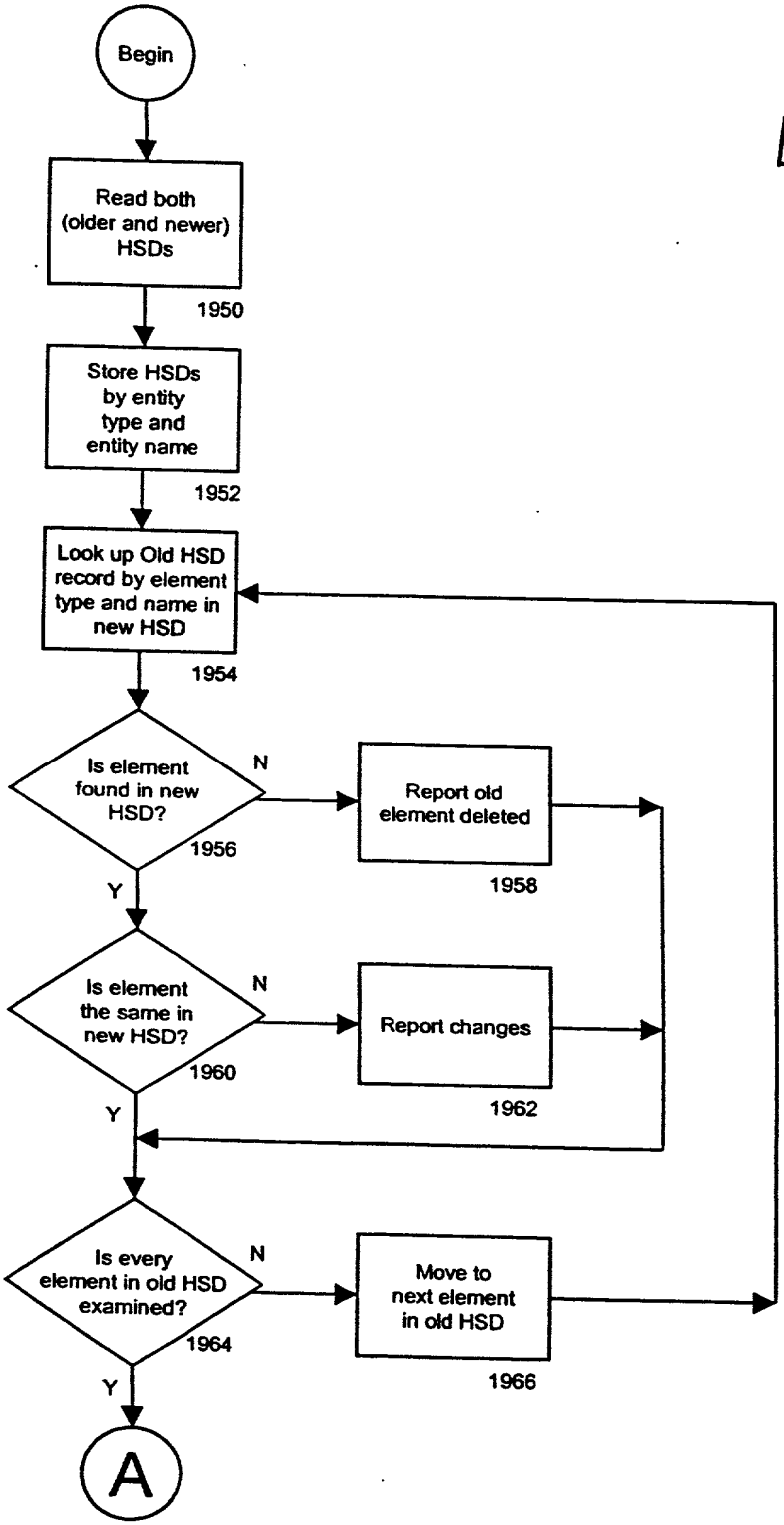
195
Begin
Read both (older and newer) HSDs
1950
Store HSDs by entity type and entity name
1952
Look up Old HSD record by element type and name in new HSD
1954
Is element found in new HSD?
1956
N
Report old element deleted
1958
Y
Is element the same in new HSD?
1960
N
Report changes
1962
Y
Is every element in old HSD examined?
1964
N
Move to next element in old HSD
1966
Y
A

FIG. 16A

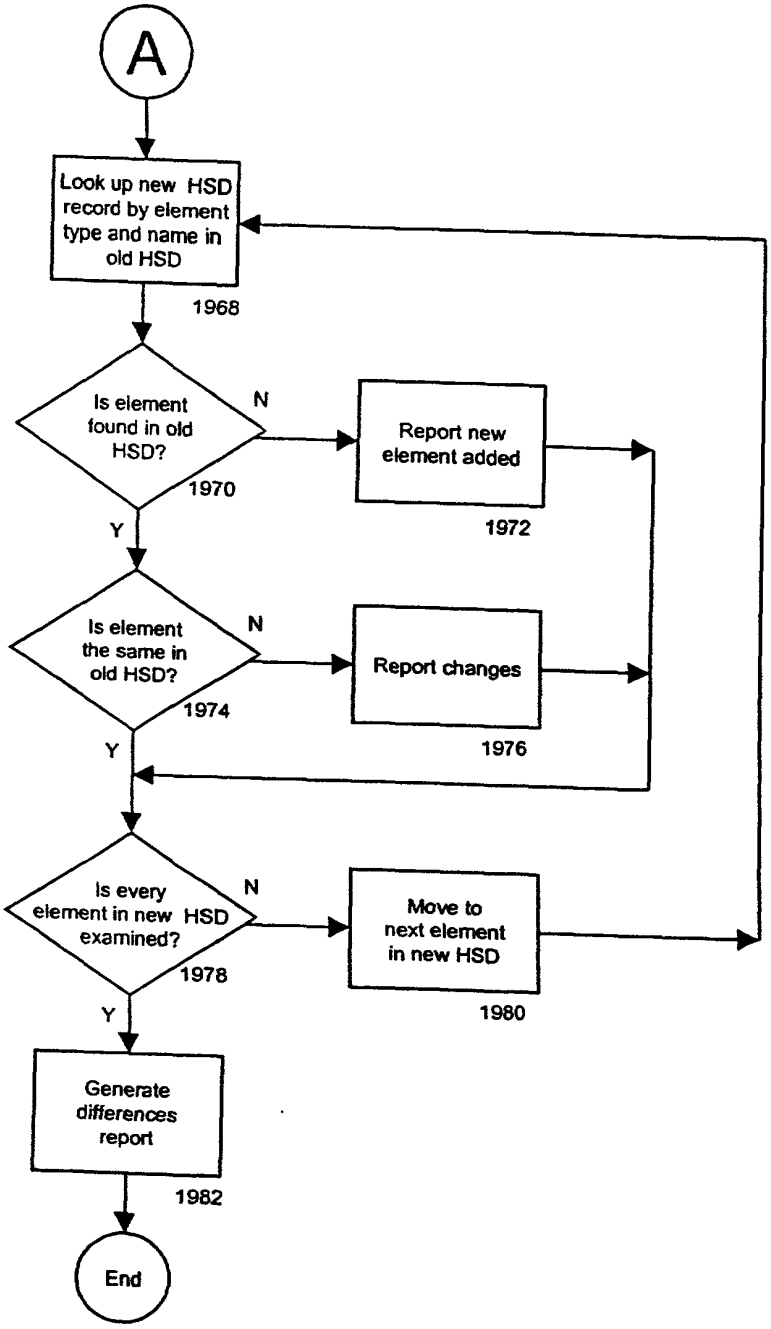
A
Look up new HSD record by element type and name in old HSD
1968
Is element found in old HSD?
1970
N
Report new element added
1972
Y
Is element the same in old HSD?
1974
N
Report changes
1976
Y
Is every element in new HSD examined?
1978
N
Move to next element in new HSD
1980
Y
Generate differences report
1982
End

FIG. 16B

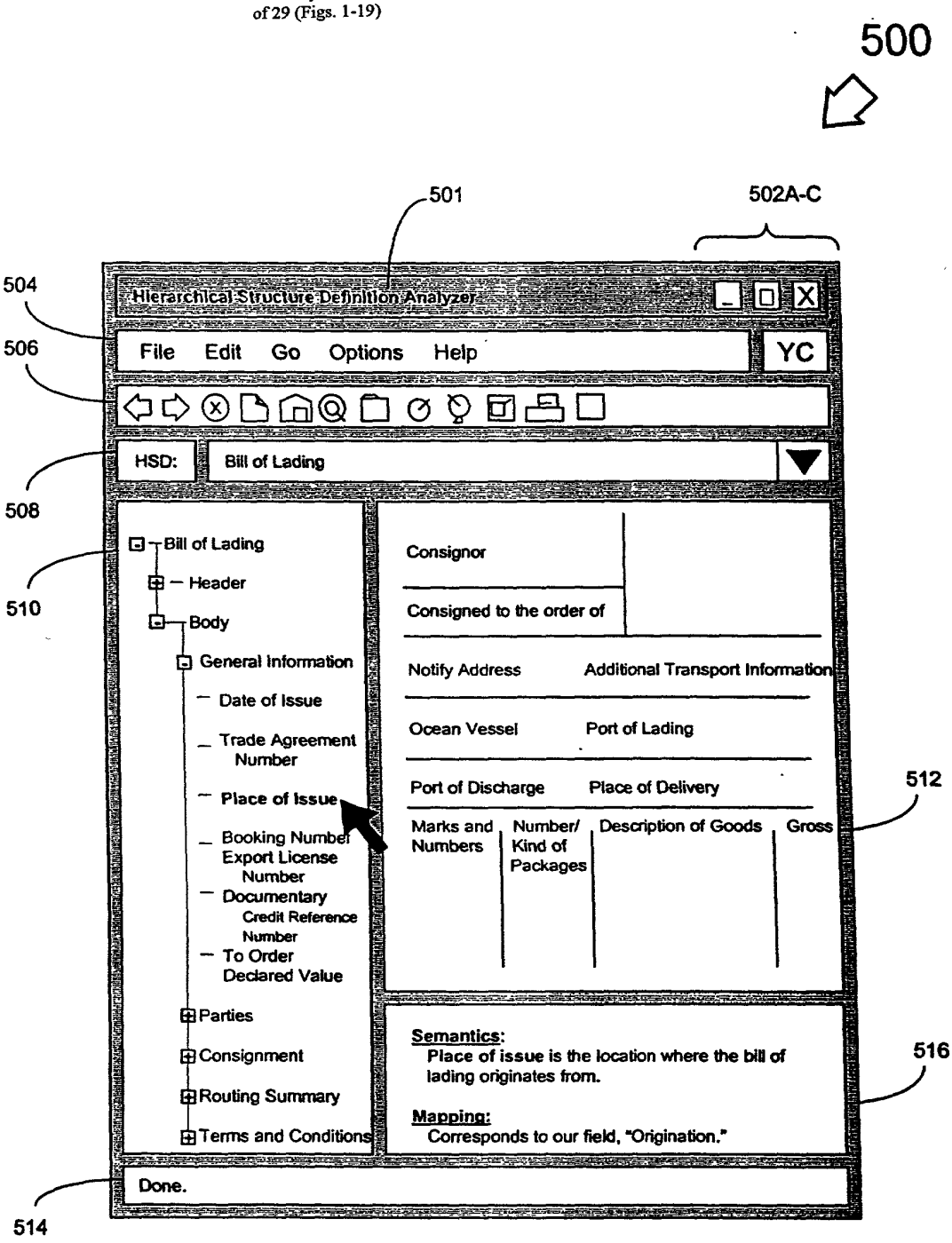
500
501
502A-C
504
506
508
510
512
514
516
Hierarchical Structure Definition Analyzer
File Edit Go Options Help
YC
HSD:
Bill of Lading
Bill of Lading
Header
Body
General Information
Date of Issue
Trade Agreement Number
Place of Issue
Booking Number
Export License Number
Documentary Credit Reference Number
To Order Declared Value
Parties
Consignment
Routing Summary
Terms and Conditions
Consignor
Consigned to the order of
Notify Address
Additional Transport Information
Ocean Vessel
Port of Lading
Port of Discharge
Place of Delivery
Marks and Numbers
Number/ Kind of Packages
Description of Goods
Gross
Semantics:
Place of issue is the location where the bill of lading originates from.
Mapping:
Corresponds to our field, "Origination."
Done.

FIG. 17